Studies in Language, Education, and Culture (SeLEC) E-ISSN: 3109-3760
Vol. 2 No. 1 (May, 2026), pp. 34-46
https://doi.org/10.56303/selec.v2i1.1380

Integrating Tree Diagram Technique into Vocabulary Teaching in EFL Settings

Novia Irhana Ramadhani[1], Arni Arsyad Sultan[1] ✉, Ilyas[1], Lewi Kabanga[4]
[1] English Education Study Program, Institut Agama Islam Negeri Bone, South Sulawesi, Indonesia
[2]English Linguistics, State Protestant Christian College of Sentani, Papua, Indonesia
✉ email: arni.arsyad@iain-bone.ac.id

Received:
April 10, 2026
Revised:
April 23, 2026
Accepted:
May 21, 2026
Published:
May 28, 2026

ABSTRACT

This study investigates the effectiveness of the Tree Diagram Technique in improving junior high school students' mastery of basic English vocabulary in Indonesia. Vocabulary plays an essential role in language acquisition; however, many students experience difficulties in learning new words due to monotonous instructional methods. The Tree Diagram Technique, as a visual learning strategy, helps students organize vocabulary into meaningful categories, thereby supporting comprehension and memory retention. This study employed a quantitative approach using a one-group pretest–posttest design. The participants were 25 eighth-grade students of a junior high school in Bone Regency. Data were collected through a 20-item vocabulary test administered before and after the treatment. The results of the Wilcoxon signed-rank test revealed a statistically significant improvement in students' vocabulary achievement, with the mean score increasing from 51.4 in the pretest to 82.4 in the posttest ($p < 0.05$). These findings indicate that the Tree Diagram Technique is an effective instructional strategy for enhancing students' vocabulary mastery in EFL classrooms. The study also contributes to EFL pedagogy by demonstrating the potential adaptation of the Tree Diagram Technique from syntactic analysis into engaging and visually organized vocabulary instruction.

Keywords: *EFL Learners; Tree Diagram Technique; Vocabulary Mastery; Visual Learning Strategy*

INTRODUCTION

English plays an increasingly important role in Indonesian junior high schools, not only as a compulsory subject but also as a gateway to global communication, knowledge, and technology. However, because English is taught as a foreign language (EFL), many students still experience difficulties in achieving basic communicative competence. Among the components of language learning, vocabulary is considered fundamental because meaningful

communication cannot occur without sufficient lexical knowledge (ALQAHTANI, 2015). Vocabulary supports the development of listening, speaking, reading, and writing skills and serves as an essential element of language comprehension and use (Karami & Bowles, 2019; Yaacob et al., 2019). Vocabulary knowledge includes not only understanding word meanings but also recognizing pronunciation, spelling, grammatical functions, and relationships between words such as associations and collocations (Namaziandost et al., 2021). In addition, vocabulary development involves both receptive knowledge, which refers to the ability to recognize and understand words, and productive knowledge, which refers to the ability to use words appropriately in speaking and writing (Tahmasbi & Farvardin, 2017). Research has also shown that vocabulary acquisition is influenced by cognitive and affective factors, including motivation and self-confidence (Li, 2021; Sultan, 2023). Therefore, effective vocabulary instruction requires learning experiences that are structured, meaningful, and engaging.

In the field of English Language Teaching (ELT), vocabulary instruction continues to attract attention, particularly regarding the balance between incidental exposure and explicit teaching. Although incidental learning through reading and listening contributes to vocabulary growth, many EFL contexts with limited language exposure still depend heavily on explicit instructional strategies (Namaziandost et al., 2021). As a result, visual learning strategies have gained increasing attention because they can support vocabulary retention and lexical organization. One commonly used visual strategy is semantic mapping, which helps learners identify relationships among words within specific categories to facilitate comprehension and memory (Al-Khasawneh & Al-Hawamdeh, 2023).

Tree diagrams, which are traditionally used in syntactic analysis to represent sentence structures, have also been applied in language teaching. Previous studies used tree diagrams to support argumentative writing among university-level EFL learners (Liu, 2018) and to address structural ambiguity in sentence parsing (Bochari & Hastini, 2025). Other studies explored the use of tree-based techniques to improve vocabulary mastery (Ernawati, Nadrun, & Omolu, 2021; Olyvia Revalita Candraloka & Novitasari, 2022). However, these studies differed in educational level, methodological design, and instructional focus. Most of them focused on higher-level learners or broader vocabulary instruction without emphasizing systematic hierarchical categorization for beginner learners.

Despite the growing interest in visual learning strategies, limited research has examined the adaptation of tree diagrams as hierarchical semantic tools for teaching basic vocabulary to junior high school EFL learners. Many classroom-based studies reported vocabulary improvement but provided limited

explanation of how visual hierarchy supports lexical organization and cognitive processing. Therefore, there remains a need to investigate how the Tree Diagram Technique can function not only as a classroom activity but also as a structured lexical organization strategy that facilitates deeper vocabulary processing in EFL contexts.

This study aims to investigate the effectiveness of the Tree Diagram Technique in improving junior high school students' mastery of basic English vocabulary in Indonesia. The vocabulary instruction focused on concrete nouns related to the themes of family and body parts. In this study, vocabulary mastery was evaluated through students' ability to recognize words, understand meanings, and classify vocabulary based on thematic relationships. By reconceptualizing the Tree Diagram as a hierarchical semantic structuring tool, this study seeks to contribute to EFL pedagogy and to ongoing discussions regarding structured visual scaffolding in vocabulary instruction. The findings are expected to provide practical insights for teachers in designing more engaging and visually organized vocabulary learning activities that support students' vocabulary retention and understanding.

METHOD

This study employed a quantitative approach using a pre-experimental design with a one-group pretest-posttest model. Pre-experimental designs are commonly used in educational research to examine the effects of an intervention before implementing more rigorous experimental procedures (Campbell & Stanley, 1963). In this design, students' vocabulary achievement was measured before and after the treatment to determine the effectiveness of the Tree Diagram Technique. The quantitative approach enabled the researcher to obtain measurable data and analyze the results statistically through descriptive and inferential analysis (Sawitri, 2025). Since this study did not involve a control group or random assignment of individual participants, the design focused on observing changes in students' performance following the treatment (Marquez et al., 2022).

The population of this study consisted of all eighth-grade students at a junior high school in Bone Regency during the 2024/2025 academic year. The total population comprised 47 students distributed across two classes. The sample consisted of 25 students from Class VIII B. The sample was selected through cluster random sampling at the class level using a lottery technique. The names of the two eighth-grade classes were written on separate pieces of paper, and one class was randomly selected as the research sample. As a result, Class VIII B was chosen as the participants of the study. This sampling technique ensured that each class had an equal opportunity to be selected and helped reduce selection bias (Makwana Dhaval et al., 2023).

The data were collected through pre-test and post-test assessments designed to measure students' vocabulary mastery before and after the treatment. To maintain consistency in measurement, both tests were constructed with equivalent levels of difficulty and similar content coverage. The instrument consisted of 20 items, including 10 multiple-choice questions, 5 matching items, and 5 fill-in-the-blank questions. The treatment was conducted in four instructional sessions in which students learned vocabulary through the Tree Diagram Technique. The instructional materials focused on concrete nouns related to family and body parts.

The primary research instrument in this study was a vocabulary test consisting of a pre-test and a post-test. To ensure content validity, the instrument was reviewed by two lecturers in English Education with expertise in vocabulary instruction and language assessment. The validation process evaluated the relevance of the test items, clarity of instructions, alignment with learning objectives, and appropriateness of difficulty level for eighth-grade students. Revisions were made based on the experts' suggestions before the instrument was administered. Content validity was used to ensure that the test items appropriately represented the instructional content and research objectives (Kurniawan et al., 2022).

The collected data were analyzed quantitatively using descriptive and inferential statistics. Descriptive statistics were used to calculate the mean and standard deviation of students' scores, while inferential analysis was conducted to examine the significance of the students' improvement after the treatment. All statistical analyses were performed using SPSS version 27 to ensure the accuracy and reliability of the results.

$$\text{Score} = \frac{\text{The number of the score obtained}}{\text{Maximal score}} \text{ x100}$$

Figure 1. The formula for calculating the total score

Then, the authors classified the students' scores in the pre-test and post-test based on the following criteria. The students' mean scores were categorized into five levels, using the following interval classifications:

$$\text{Interval score} = \frac{\text{Highest score} - \text{Lowest score}}{\text{Total item}}$$

Figure 2. The formula for calculating the interval score

Table 1. Interval Score (Nitko & Brookhart, 2014)

No	Classification	Score
1	Very good	84-100
2	Good	68-83
3	Fair	52-67
4	Poor	36-51
5	Very poor	20-35

The data in this study were analyzed using IBM SPSS (Statistical Product and Service Solutions) version 27. This software is commonly used to perform various statistical analyses, including both descriptive and inferential methods, and helps researchers process data efficiently (Pallant, 2020).

The data analysis procedure incorporated both descriptive and inferential statistical techniques. Descriptive statistics were utilized to summarize the data, including measures such as the mean, percentage, minimum and maximum values, median, and standard deviation, thereby providing an overall representation of the data distribution. In addition, inferential statistical methods were applied to test the research hypothesis and to draw conclusions regarding its acceptance or rejection. Hypothesis testing was conducted using appropriate statistical procedures, which were selected based on the normality of the data distribution:

(1) If the data were normally distributed, the Paired Sample t-Test was applied.

(2) If the data were not normally distributed, the Wilcoxon signed-rank test was used as an alternative method. This non-parametric test is applied to compare two related samples when the assumption of normality required for the paired-samples t-test is not met (Field, 2013).

The criterion for hypothesis testing was determined based on the significance value (p-value). A p-value of less than 0.05 ($p < 0.05$) was interpreted as indicating a statistically significant difference between students' pre-test and post-test scores (Leppink, 2019). Furthermore, the effectiveness of the Tree Diagram Technique in enhancing students' basic vocabulary was evaluated using a 95% confidence interval ($\alpha = 0.05$). All statistical analyses in this study were carried out using IBM SPSS version 27 for Windows to maintain accuracy and consistency in data processing.

FINDINGS AND DISCUSSION

To examine the effectiveness of the Tree Diagram Technique in improving students' vocabulary knowledge, the researcher compared the results of the pre-test and post-test. The pre-test was administered before the

treatment, while the post-test was conducted after the treatment, as presented in the following results.

Table 2. The Frequency and Percentage of Students' Pre-Test and Post-Test

NO	Score	Classification	Pre-test		Post-test	
			Frequency	Percentage	Frequency	Percentage
1	84-100	Very Good	6	24%	12	48%
2	68-83	Good	1	4%	12	48%
3	52-67	Fair	3	12%	1	4%
4	36-51	Poor	7	28%	0	0%
5	20-35	Very Poor	8	32%	0	0%

By comparing the statistical values obtained from the pre-test and post-test, the researchers were able to determine whether an overall improvement had occurred and to assess the consistency of performance changes among the students.

In addition, to gain a clearer understanding of students' vocabulary performance before and after the treatment, descriptive statistical analyses were applied to both pre-test and post-test scores. The analysis included measures such as the mean, minimum and maximum scores, as well as the standard deviation. The mean score offered insight into the average level of students' vocabulary performance prior to and following the implementation of the Tree Diagram Technique. The minimum and maximum scores represented the range of student achievement, indicating the lowest and highest scores attained in each assessment. In addition, the standard deviation reflected the degree of variability or dispersion of students' scores around the mean.

Table 3. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test	25	20.00	90.00	51.8000	24.78575
Post-test	25	65.00	100.00	82.4000	11.28421
Valid N (listwise)	25				

The table above indicated a notable improvement in students' vocabulary performance after the treatment.

Considering that the number of respondents in this research was less than 100 people, the authors used the Shapiro-Wilk normality test technique with the help of the SPSS 27 program for Windows to assess the normality of data distribution with decision criteria (Rao et al., 2024):
(1) If p-value $\geq 0.05 \rightarrow$ fail to reject H_0, meaning the data is normally distributed.
(2) If p-value $< 0.05 \rightarrow$ reject H_0, meaning the data is not normally distributed.

Table 4. Normality Test

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre-test	.203	25	.009	.870	25	.004
Post-test	.148	25	.165	.904	25	.022

it is noticeable that the p-value of the pre-test is 0.004 and the p-value of the post-test is 0.022, both are less than 0.05. It indicates that the data is not normally distributed.

In this study, a hypothesis was formulated to examine whether the implementation of the Tree Diagram Technique could significantly enhance students' basic English vocabulary knowledge. Since the pre-test and post-test data came from the same group and did not satisfy the normality assumption, the Wilcoxon signed-rank test was used as the appropriate statistical procedure. The decision criteria for hypothesis testing were established in accordance with Corder & Foreman, (2014):

(1) If $p < 0.05$, then H_0 is rejected and H_1 is accepted.

(2) If $p \geq 0.05$, then H_0 is accepted.

Table 5. Wilcoxon Signed Ranks Test

	Post-test – Pre-test
Z	-4.382[b]
Asymp. Sig. (2 - tailed)	.000

The results shown in the table reveal that the Wilcoxon signed-rank test produced a p-value of 0.000, which is lower than the significance level of 0.05. This indicates a significant difference between the pre-test and post-test scores. Therefore, the null hypothesis was rejected, while the alternative hypothesis was accepted.

The significant improvement in students' post-test scores suggests that the Tree Diagram Technique contributed positively to vocabulary development. However, the effectiveness of the technique cannot be explained merely by repeated exposure to words. The structured nature of the Tree Diagram likely played a central role in supporting students' cognitive processing.

By organizing vocabulary into hierarchical branches, students were required to actively classify words into thematic categories. This process encouraged deeper semantic processing rather than surface-level memorization. Instead of learning isolated lexical items, learners constructed meaningful relationships among words, which may have strengthened associative memory and facilitated retention. The visual representation of connections between superordinate and subordinate categories (e.g., "family" and its members) may have helped students build organized lexical networks.

Furthermore, the classroom implementation of the technique involved guided discussion and collaborative identification of word categories. During the treatment sessions, students were not only asked to memorize vocabulary but also to explain why certain words belonged to specific branches of the diagram. This interactive process may have increased cognitive engagement and promoted retrieval practice, both of which are known to enhance long-term vocabulary retention.

The findings of this study offer several practical implications for English teachers, particularly in EFL contexts where vocabulary instruction often relies on memorization. The Tree Diagram Technique can be implemented through structured instructional steps that encourage active student engagement and semantic organization.

First, the teacher introduces a central theme (for example, “Family” or “Parts of the Body”) and writes it at the top or center of the board. Second, students are guided to identify broader subcategories related to the theme. For instance, under “Family,” branches such as “Nuclear Family” and “Extended Family” can be created. Third, learners collaboratively generate specific vocabulary items and place them under the appropriate branches. During this process, the teacher facilitates discussion by asking students to explain why certain words belong to particular categories.

Fourth, the completed diagram can be used as a reinforcement tool. Teachers may ask students to reconstruct the diagram individually, create their own thematic diagrams, or use the vocabulary in short sentences. This encourages retrieval practice and supports long-term retention. The technique can also be adapted for pair or group work, promoting interaction and peer learning.

Importantly, the Tree Diagram Technique does not require advanced technological resources. It can be implemented using simple classroom tools such as whiteboards, paper, or worksheets. Therefore, it is particularly suitable for schools with limited access to digital learning facilities.

By shifting vocabulary instruction from isolated memorization to structured categorization, teachers may foster deeper lexical understanding and more meaningful vocabulary acquisition. However, successful implementation depends on clear guidance, active participation, and consistent practice.

From a cognitive perspective, hierarchical visual structuring supports schema development by allowing learners to integrate new lexical items into existing knowledge frameworks. In EFL contexts where exposure to English is limited, such structured support becomes particularly important. Therefore, the improvement observed in this study may reflect the combined effects of categorization, visual scaffolding, and active learner participation rather than simple repetition of vocabulary items.

These findings are consistent with earlier studies which have demonstrated that the Tree Diagram Technique can effectively support language learning. (Ernawati, Nadrun, & Omolu, F., 2021; Novitasari & Candraloka, 2022). However, some previous studies presented different approaches or findings, for instance, Tree Analysis Diagrams used to help EFL university students (Bochari & Hastini, 2025; Liu, 2018) to organize their ideas in writing or to understand the sentence to avoid ambiguity.

This study still has several limitations, such as a narrow scope, a focus limited to specific types of vocabulary (concrete nouns with themes like family and body parts), and it was conducted in only one school with a limited sample size. This study employed a one-group pretest–posttest design without a control group. While the findings indicate a statistically significant improvement, caution must be exercised in attributing the gains solely to the Tree Diagram Technique. Other factors, such as repeated exposure to vocabulary items, classroom interaction, or testing effects, may have also contributed to the observed improvement. Therefore, the results should be interpreted as indicative rather than definitive evidence of effectiveness.

Therefore, future researchers are encouraged to expand this study by covering a broader scope. For instance, testing the effectiveness of the Tree Diagram technique on other types of vocabulary (such as verbs or adjectives), at different educational levels (such as high school or university students), or even on other language skills like reading and writing. In addition, future researchers are recommended to use mixed-method approach (quantitative and qualitative) in order to gain a deeper understanding of students' engagement and thinking processes during the use of the Tree Diagram Technique. in order to gain a deeper understanding of students' engagement and thinking processes during the use of the Tree Diagram Technique. Thus, this study opens opportunities and serves as a foundation for further research to optimize the use of Tree Diagrams in various English language learning contexts and also Future research may explore the application of the Tree Diagram Technique across different grade levels and language proficiency backgrounds. Investigating its integration with digital tools or collaborative learning strategies may also provide further insights into its pedagogical potential.

Although this study was conducted in a specific Indonesian junior high school context, the challenges addressed in this research are not unique to this setting. Many EFL classrooms around the world face similar conditions, particularly limited exposure to English outside the classroom and a heavy reliance on teacher-centered instruction. In such contexts, learners often depend on structured classroom strategies to develop their vocabulary knowledge.

The Tree Diagram Technique may therefore offer practical relevance beyond the immediate research setting. Its emphasis on hierarchical categorization and visual organization can be adapted to various EFL environments where learners require systematic support in organizing lexical knowledge. The technique does not depend on advanced technological tools and can be implemented in resource-limited classrooms, making it potentially suitable for schools with similar instructional constraints.

Moreover, while this study focused on junior high school learners and concrete nouns, the underlying principle of visual hierarchical structuring may also be applicable to other learner groups and vocabulary types. For instance, the technique could be adapted for abstract vocabulary, thematic units in secondary education, or even academic vocabulary instruction at higher levels. However, further research is necessary to examine its effectiveness across different proficiency levels and educational contexts.

By situating the findings within broader EFL challenges, this study contributes to ongoing discussions on how structured visual scaffolding can support vocabulary development in foreign language learning environments characterized by limited exposure and instructional time.

CONCLUSION

In line with the research objective of examining the use of the Tree Diagram Technique in enhancing students' basic English vocabulary knowledge, the findings show that students' vocabulary scores improved after the implementation of the technique. This result indicates that the Tree Diagram Technique may serve as a supportive instructional strategy for helping students organize and understand basic vocabulary, particularly nouns, in the context of this study. The structured categorization of words appears to assist students in recognizing relationships among vocabulary items, which may contribute to clearer comprehension. However, since the study was conducted within a single classroom setting and without a comparison group, the findings should be interpreted within these limitations.

Overall, the Tree Diagram Technique can be considered a practical alternative for vocabulary instruction at the junior high school level. Further research with broader samples and more rigorous designs is recommended to strengthen the evidence regarding its effectiveness.

ACKNOWLEDGMENTS

The authors would like to express the greatest thank and appreciation both to Mr. Aschawir Ali and Mrs. Siti Nurul Ilmi for their valuable academic contribution to the development of this article. Both of them have given important consideration, constructive guidance, and extensive feedback which

have supported throughout the process, from refining the research title to shaping the overall structure, and reviewing the references. The authors truly appreciate their support that has been extended to the creation of this paper.

REFERENCES

Al-Khasawneh, F. M., & Al-Hawamdeh, N. M. A. (2023). The Potential of Semantic Mapping Strategy To Enhance Vocabulary Learning. Journal of Southwest Jiaotong University, 58(1), 924–934. https://doi.org/10.35741/issn.0258-2724.58.1.77

ALQAHTANI, M. (2015). The importance of vocabulary in language learning and how to be taught. International Journal of Teaching and Education, III(3), 21–34. https://doi.org/10.20472/te.2015.3.3.002

Alsahafi, M. (2023). The Relationship Between Depth of Academic English Vocabulary Knowledge and Academic Success of Second Language University Students. SAGE Open, 13(1), 1–9. https://doi.org/10.1177/21582440231153342

Bochari, S., & Hastini, H. (2025). Visualizing Syntax: the Effectiveness of Tree Diagram-Based Sentence Parsing in Addressing Structural Ambiguity in Efl. Jurnal Eduscience, 12(5), 1225–1236. https://doi.org/10.36987/jes.v12i5.7543

Campbell, D. T., & Stanley, J. C. (1963). Experimental and Quasi-Experimental Designs for Research. In Handbook of Research on Teaching (5). Houghton Mifflin Company.

Corder, G. W., & Foreman, D. I. (2014). Nonparametric Statistics: A Step-by-Step Apprach (2nd ed.). Wiley.

Danesh, T., & Farvardin, M. T. (2016). A Comparative Study of the Effects of Different Glossing Conditions on EFL Learners' Vocabulary Recall. SAGE Open, 6(3). https://doi.org/10.1177/2158244016669548

Ernawati, Nadrun, & Omolu, F., A. (2021). Mengaplikasikan Tehnik Pohon untuk Meningkatkan Kosa Kata Siswa Kelas VII MTS Negeri 1 Palu. Jurnal Kolaboratif Sains, 04(02), 110–115.

Field, A. (2013). Discovering Statistics using IBM SPSS Statistics (4th ed.). Sage.

Karami, A., & Bowles, F. A. (2019). Which strategy promotes retention? Intentional vocabulary learning, incidental vocabulary learning, or a mixture of both? Australian Journal of Teacher Education, 44(9), 25–43. https://doi.org/10.14221/ajte.2019v44.n9.2

Kurniawan, A., Febrianti, A. N., Risan, R., Merris, D., & Sari, M. (2022). Evaluasi Pembelajaran. PT. Global Eksekutif Teknologi.

Leppink, J. (2019). Statistical Methods for Experimental Research in Education and Psychology. In Springer Text in Education. Springer. https://doi.org/https://doi.org/10.1007/978-3-030-21241-4

Li, R. (2021). Does Game-Based Vocabulary Learning APP Influence Chinese EFL Learners' Vocabulary Achievement, Motivation, and Self-Confidence? SAGE Open, 11(1), 1–12. https://doi.org/10.1177/21582440211003092

Liu, X. (2018). Research on the Application of "Tree Analysis Diagram" to the Teaching of English Argumentative Writing of the Chinese EFL Learners. English Language Teaching, 11(3), 137. https://doi.org/10.5539/elt.v11n3p137

Makwana Dhaval, Engineer Priti, Dabhi Amisha, & Chudasama Hardik. (2023). Sampling Methods in Research: A Review Dhaval. Ijtsrd, 7(3), 762–768.

Marquez, N. M., Saintila, J., Castellanos-Vazquez, A. J., Dávila-Villavicencio, R., Turpo-Chaparro, J., Sánchez-Tarrillo, J. A., Salinas Arias, S. A., Calizaya-Milla, Y. E., & Morales-García, W. C. (2022). Telehealth-based interventions on lifestyle, body mass index, and glucose concentration in university staff during the coronavirus disease 2019 pandemic: A pre-experimental study. Digital Health, 8. https://doi.org/10.1177/20552076221129719

Namaziandost, E., Sawalmeh, M. H. M., Tilwani, S. A., Ziafar, M., Arianti, A., Hernández, R. M., Razzhivin, O. A., Ocaña-Fernández, Y., Fuster-Guillén, D., & Garay, J. P. (2021). Manipulation of the Involvement Load of L2 Reading Tasks: A Useful Heuristic for Enhanced L2 Vocabulary Development. SAGE Open, 11(4), 1–10. https://doi.org/10.1177/21582440211051723

Nitko, A. J., & Brookhart, S. M. (2014). Educational Assessment of Students (Sixth). Pearson.

Novitasari, A., & Candraloka, O. R. (2022). The Effect of Using Tree Diagram Technique for Improving Students' Vocabulary Mastery. J-SHMIC : Journal of English for Academic, 9(2), 68–79. https://doi.org/10.25299/jshmic.2022.vol9(2).9881

Pallant, J. (2020). Designing A Study. In SPSS Survival Manual A Step by Step Guide to Data Analysis using IBM SPSS (7th ed., p. 359). Routledge.

Pandey, P., & Pandey, M. M. (2015). Research Methodology: Tools and Techniques. In Grassroots Youth Work. Bridge Center. https://doi.org/10.56687/9781447328629-011

Rao, R., Paramasivam, G., Ramachandra Rao, I., & Prabhu, M. A. (2024). Normality Testing in Statistics: What Clinician-Researchers Should Know. Heart Failure Journal of India, 55–60. https://doi.org/10.4103/HFJI.HFJI_7_24

Sawitri, N. N. (2025). The Role of Mixed Methods : Qualitative , Quantitative , Positivism , and Post-Positivism. International Journal of Advanced Multidisciplinary, 3(4), 558–568.

Sugiyono. (2017). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Alfabeta Bandung.

Sultan, A. A. (2023). Intimacy Over Power Developing Learners' Motivation: A Study At ESP Class. IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature, 11(1), 915–926. https://doi.org/10.24256/ideas.v11i1.3924

Tahmasbi, M., & Farvardin, M. T. (2017). Probing the Effects of Task Types on EFL Learners' Receptive and Productive Vocabulary Knowledge: The Case of Involvement Load Hypothesis. SAGE Open, 7(3), 1–10. https://doi.org/10.1177/2158244017730596

Willie, M. M. (2024). Population and Target Population in Research Methodology. Golden Ratio of Social Science and Education, 4(1), 75–79. https://doi.org/10.52970/grsse.v4i1.405

Yaacob, A., Shapii, A., Saad Alobaisy, A., Al-Rahmi, W. M., Al-Dheleai, Y. M., Yahaya, N., & Alamri, M. M. (2019). Vocabulary Learning Strategies Through Secondary Students at Saudi School in Malaysia. SAGE Open, 9(1), 1–12. https://doi.org/10.1177/2158244019835935